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10/084,989	03/01/2002	Cheng Chi Wang	4459-079	1134

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EXAMINER

DUONG, THOI V

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 03/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/084,989

Applicant(s)

WANG, CHENG CHI

Examiner

Thoi V Duong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5-8,12,17,18,22 and 23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5-8,12,17,18,22 and 23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the Amendment filed January 16, 2004.

Accordingly, claims 1, 6, 12 and 17 were amended, claims 3, 4, 9-11, 13-16 and 19-21 were cancelled, and new claims 22 and 23 were added. Currently, claims 1, 2, 5-8, 12, 17, 18, 22 and 23 are pending in this application.

With respect to claims 1, 2, 5, 17 and 18, Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn. However, upon further consideration, a new ground(s) of rejection is made as follows.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 6-8, 12, 22 and 23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. With respect to claims 6 and 22, it is unclear how a visible light reflectance greater than 95% can be obtained with an Ag-Al alloy contains about 5 at% or about 10 at% of silver as recited in claim 22 and claim 6 respectively. According to USPN 5,986,204 of Iwasaki et al., as shown in Fig. 5, the reference of Iwasaki et al. only discloses that the maximum reflectivity of 86% is obtained for an Ag-Al alloy having

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about 7 at% of silver and a reflectivity of greater than 95 or 97% can be obtained for the Ag-Al alloy having about 90 at% of silver. Claims 7, 8, 12 and 23 are also rejected since they are dependent on unallowable claims 6 and 22.

4. Claim 17 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. It is unclear how the TFT panel works when each of the pixel electrodes directly contacts the layer of molybdenum of the gate line. In the Examiner's opinion, the pixel electrode should contact the second molybdenum layer of the source electrode which is recited in claim 18.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 12 recites the limitation "the annealed Ag-Al alloy" in the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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8. Claims 1 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun Chae et al. (Pub. No. US 2002/0135709 A1) in view of Jeong et al. (USPN 6,486,514 B2) and Iwasaki et al. (USPN 5,986,204).

As shown in Figs. 1 and 4, Sun Chae et al. discloses a thin film transistor (TFT) panel comprising:

- a gate line 11 with a gate electrode 3 on a substrate 1;
- a gate insulating layer 9 on the gate line;
- a semiconductor layer 15 on the gate insulating layer;
- a conductive pattern layer with source and drain electrodes 5 and 7 spaced apart on the semiconductor layer, the conductive pattern layer comprising a first layer of molybdenum 6a, an Al alloy layer 6b on the first molybdenum layer and a second layer of molybdenum 6c on the Al alloy layer (page 1, paragraph 16);
- a passivation layer 21 on the semiconductor layer and the conductive pattern layer, the passivation layer having a plurality of contact holes 19b; and
- a plurality of pixel electrodes 23 on the passivation layer, each of the pixel electrodes extending into one of the contact holes to contact the second layer 6c.

Sunchae et al. discloses a TFT panel that is basically the same as that recited in claims 1 and 5 except that the alloy layer is not an Ag-Al alloy layer. As shown in Figs. 9 and 10, Jeong et al. discloses that a gate line 22 and a data line 62 with a source electrode 65 and a drain electrode 66 spaced apart on a semiconductor layer 40, are formed of an Ag-Al alloy (col. 8, lines 28-41 and col. 9, lines 1-15). Jeong et al. teaches that the Ag-Al alloy bears low resistance, low melting point and good adhesion

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characteristics while the Al alloy bears a weak physical or chemical characteristics and erodes easily at the contacting area, when contacting other conducting materials (col. 1, lines 24-40). However, Jeong et al. does not disclose the atomic percentage of silver in the Ag-Al alloy layer. As shown in Figs. 1 and 5, Iwasaki et al. discloses a reflecting layer 102 comprising an Ag-Al alloy having a content of silver equal to or less than 30 atomic% (col. 4, lines 19-23 and col. 5, lines 26-48) so as to obtain a reliable device due to high reflectivity and migration resistance of the reflecting layer (col. 4, lines 24-31). Fig. 5 also indicates that the reflectivity has a maximum value in the vicinity of 7 at% of Ag. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the TFT panel of Sunchae et al. with the teaching of Jeong et al. and Iwasaki et al. by forming an Ag-Al alloy containing about 5 to about 10 at% of silver so as to obtain a reliable device.

9. Claims 6-8 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al. (USPN 6,466,280 B1) in view of Shimada et al. (USPN 5,805,252) and Iwasaki et al. (USPN 5,986,204).

As shown in Figs. 5A-5D and 6, Park discloses a liquid crystal display, comprising:

a bottom plate 1 comprising reflective electrodes 68; and

a liquid crystal layer sandwiched between the top plate and the bottom plate (col. 2, lines 54-57),

wherein an image is generated by the liquid crystal display when ambient light 110 is incident to the surface of the top plate (Fig. 6).

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The liquid crystal display further comprises a light source below the bottom plate (col. 2, lines 54-57) wherein each of the reflective electrodes has at least one aperture 72 defined therein such that an image is generated by the liquid crystal display when light 112 from the light source passes through the apertures of the reflective electrodes.

wherein the bottom plate further comprises (see Fig. 1):

a plurality of parallel gate lines 6, 8;

a plurality of parallel data lines 2, 4 formed perpendicular to the gate lines, the gate lines and the data lines being arranged to form a matrix of pixel regions with each of the pixel regions bounded by two adjacent gate lines and two adjacent data lines; and

a plurality of thin film transistors S formed at intersections between the gate lines and data lines,

wherein each of the reflective electrodes is respectively disposed in one of the pixel regions and functions as a pixel electrode (col. 4, lines 64-67).

The liquid crystal display of Park et al. includes all that is recited in claims 6-8 and 12 except for a top plate comprising a transparent electrode and the reflective electrodes of an Ag-Al alloy containing about 10 at% of silver, the reflective electrodes having a visible light reflectance greater than 95%. As shown in Fig. 14, Shimada et al. discloses a reflection type liquid crystal display comprising a top plate 30b comprising a transparent electrode 47 (col. 11, lines 3-7). Meanwhile, as shown in Figs. 1 and 5, Iwasaki et al. discloses a reflecting layer 102 comprising a thin film of Ag-Al alloy having a content of silver (Ag) equal to or less than 30 at% (col. 4, lines 19-23 and col. 5, lines 26-44) so as to obtain a reliable device due to high reflectivity and migration resistance

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of the reflecting layer (col. 4, lines 24-31). According to Fig. 5, the reflectivity of about 90 % is obtained with 10 at% of Ag. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the TFT panel of Park et al. with the teaching of Shimata et al. and Iwasaki et al. by forming a top plate comprising a transparent electrode for a reflective display and an Ag-Al alloy containing about 10 at% of silver so as to improve the brightness of the display.

Finally, as to the product-by-process limitation “wherein the Ag-Al alloy is annealed at temperatures from about 200 degrees C to about 250 degrees C” of claims 12 and 23, it has been recognized that “Even through product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior art product was made by a different process”. *In re Thorpe*, 227 USPQ 964,966 (Fed. Cir. 1985). See also MPEP 2113.

10. Claims 2, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun Chae et al. (Pub. No. US 2002/0135709 A1) in view of Iwasaki et al. (USPN 5,986,204) as applied to claims 1 and 5 above and further in view of Kim (USPN 6,087,678) and Jeong et al. (USPN 6,486,514 B2).

The TFT panel of Sun Chae et al. as modified in view of Iwasaki et al. above includes all that is recited in claims 2, 17 and 18 except for the gate line comprising an Ag-Al alloy layer on the substrate and a molybdenum layer on the Ag-Al alloy layer. As

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shown in Figs. 9 and 10, Jeong et al. discloses that a gate line 22 are formed of an Ag-Al alloy (col. 8, lines 28-41 and col. 9, lines 1-15). Jeong et al. teaches that the Ag-Al alloy bears low resistance, low melting point and good adhesion characteristics while the Al alloy bears a weak physical or chemical characteristics and erodes easily at the contacting area, when contacting other conducting materials (col. 1, lines 24-40).

However, the gate line of Jeong et al. is not a double structure. As shown in Fig. 6, Kim discloses a TFT panel having a gate line comprising an Al alloy layer 32 and a molybdenum layer 30 on the Al alloy layer 32 (col. 4, line 61 through col. 5, line 3) so as to improve electrode and display characteristics (col. 2, lines 56-59). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the TFT panel of Sun Chae et al. with the teaching of Jeong et al. and Kim by forming a gate line comprising an Ag-Al alloy layer and a molybdenum layer on the Ag-Al alloy layer so as to improve electrode and display characteristics.

Response to Arguments

11. Applicant's arguments filed Jan. 16, 2004 have been fully considered but they are not persuasive.

Applicant argued that the teachings of Iwasaki are deemed insufficient to establish the enablement provided for the claimed invention because the silver content is not the only factor that affects the reflectance of an alloy, but the manner in which the alloy is prepared also affected the reflectance. The Examiner disagrees with Applicant's remarks since the instant invention claims an Ag-Al alloy instead of a process of fabricating the Ag-Al alloy. The reference of Iwasaki also discloses an Ag-Al alloy

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containing about 5 at% or 10 at% of silver with the reflectance of about 90%. Since the reference of Iwasaki has been patented, the teachings of Iwasaki are sufficient to establish the enablement provided for the claimed invention. In addition, the attached Exhibit B and Table B are not considered since they are not disclosed in the specification.

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (571) 272-2292. The examiner can normally be reached on Monday-Friday from 8:30 am to 4:30 pm.

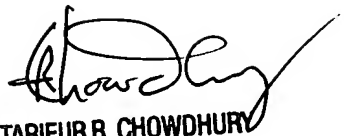
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached at (571) 272-2293.

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Thoi Duong

02/18/2004



TARIFUR R. CHOWDHURY
PRIMARY EXAMINER